Medical Gas Systems Installers

10-1.1 Scope

This standard applies to any individual who installs medical gas and vacuum systems. Medical gas systems and equipment covered in this standard include health care facilities within the scope of NFPA 99-2005 *Standard for Health Care Facilities.* Installers include anyone who works on or installs piping or components, including brazers. Medical gas piping systems include vacuum piping.

10-1.2 Purpose

The purpose of this standard is to provide minimum performance criteria, identified by industry consensus, for Medical Gas Systems Installers, to assure compliance with the referenced standards in Section 10-1.4.

10-1.3 Limitations For a Medical Gas Systems Installer

Compliance with this standard in itself shall not constitute compliance with the requirements for a Bulk System Installer per ASSE Standard 6015, a Medical Gas Inspector per ASSE Standard 6020, a Medical Gas Verifier per ASSE Standard 6030, a Medical Gas Maintenance Person per ASSE Standard 6040, a Medical Gas Instructor per ASSE Standard 6050, or a Bulk Systems Instructor per ASSE Standard 6055.

10-1.4 Reference and Industry Standards

The Reference and Industry Standards listed in ASSE Standard 6001 are a part of this standard.

10-2.1 General Knowledge

10-2.1.1 The Medical Gas Systems Installer shall be able to identify and demonstrate knowledge of the applicable laws, codes, rules, listing agencies, and regulations from the federal, state, and local levels pertaining to medical gas and vacuum systems.

10-2.1.2 The Medical Gas Systems Installer shall be able to identify and describe the actions that take place prior to and after installing and testing a medical gas system, including:

a. Notification to proper authorities (Authority Having Jurisdiction);
b. Notification to job inspector;
c. Notification to premise owners; and
d. Notification to the architect/engineer of record.

10-2.1.3 The Medical Gas Systems Installer shall be able to identify and describe the basic concepts pertaining to:

a. Absolute pressure;
b. Alarm panel locations;
c. Alarm settings;
d. Atmospheric pressure;
e. Gage pressure;
f. Instrument Air;
g. Manual valves including source valves, main valves, riser valves, service valves, in-line valves, zone valves, and valves for future connections;
h. Medical support gases;
i. Medical-surgical vacuum;
j. Oxygen deficient atmosphere;
k. Oxygen enriched atmosphere;
l. Patient medical gases;
m. Pressure and vacuum sensors;
n. Vacuum measurement;
o. Waste anesthesia gas disposal (WAGD); and
p. Zone valve locations.

10-2.2 Product Performance Knowledge

10-2.2.1 The Medical Gas Systems Installer shall be able to list the parts and to identify the major components of medical gas and vacuum systems and equipment.

10-2.2.2 The Medical Gas Systems Installer shall be able to identify and describe the proper application of medi-

cal gas and vacuum systems with respect to:

a. Level 1 systems;
b. Level 2 systems; and
c. Level 3 systems.

10-2.2.3 The Medical Gas Systems Installer shall be able to identify and describe the operating principles and performance characteristics of the medical gas and vacuum systems, and identify the following components:

a. Gas outlets;
b. Master, area, and local alarm systems;
c. Medical air compressors and accessories;
d. Medical gas manifolds;
e. Medical support gas control panels;
f. Medical-surgical vacuum systems;
g. Operation of bulk gas supplies;
h. Pressure and vacuum switches and transducers;
i. Pressure regulating valves;
j. Pressure relief valves;
k. Shut-off valves;
l. Vacuum inlets; and
m. Waste anesthetic gas disposal (WAGD) systems.

10-2.3 Product Installation Knowledge

10-2.3.1 The Medical Gas Systems Installer shall be able to identify and describe the proper installation requirements for the medical gas and vacuum systems pertaining to:

a. Manufacturer recommendations;
b. Physical location, ventilation, and accessibility; and
c. Local jurisdiction requirements.

10-2.3.2 The Medical Gas Systems Installer shall be able to identify and describe the problems resulting from the improper installation of medical gas and vacuum systems.

10-2.4 System and System Component Testing Knowledge

10-2.4.1 The Medical Gas Systems Installer shall be able to describe test procedures associated with the following components:

a. Brazed joint;
b. Bulk gas supplies;
c. Gas outlets;
d. Master, area, and local alarm systems;
e. Medical air compressors and accessories;
f. Medical gas manifolds;
g. Medical support gas control panels;
h. Medical-surgical vacuum pumps;
i. Pressure and vacuum switches and transducers;
j. Pressure regulating valves;
k. Pressure relief valves;
l. Shut-off valves;
m. Vacuum inlets;
n. Vacuum systems and components; and
o. Waste anesthetic gas disposal (WAGD) systems.

10-2.4.2 The Medical Gas Systems Installer shall be able to identify and describe procedures for the use of the following:

a. Pressure gauge;
b. Flow meter; and
c. Oxygen analyzer.

10-2.4.3 The Medical Gas Systems Installer shall be able to describe the precautions and hazards associated with tests as they relate to:

a. Confined spaces;
b. Site notification;
c Shutdown notification;
d. Electricity; and
e. Tool usage.

10-2.4.4 The Medical Gas Systems Installer shall be able to demonstrate a knowledge of the following:

a. Acceptable pipeline materials and joining methods;
b. Proper material handling;
c. Pipeline installation requirements;
d. Proper labelling requirements;
e. Certification of brazers and brazing procedures;
f. Brazing materials;
g. Installer-performed testing; and
h. Verification tests.

10-2.5 Documenting and Recording

10-2.5.1 The Medical Gas Systems Installer shall be able to identify and report the physical locations for the following items on the "as-built" drawings:

a. Emergency oxygen supply connection;
b. Main line shut-off valves;
c. Master, area and local alarm panels;
d. Medical support gas control panels;
e. Medical support gas outlets;
f. Patient medical gas outlets;
g. Pressure and vacuum switches and transducers;
h. Pressure regulating valves;
i. Pressure relief valves;
j. Riser valves;
k. Service valves;
l. Source equipment for each patient medical gas;
m. Source equipment for each medical support gas;
n. Source equipment for medical-surgical vacuum;
o. Source equipment for WAGD;
p. Source shut-off valves;

q. Station outlet/inlet; and
r. Zone valves.

10-2.5.2 The installer shall document and submit a written report (see Annex M) on all performance testing to the hospital, verifier, inspector, or Authority Having Jurisdiction as necessary. Written reports shall include, as a minimum, the following:

a. Test performed;
b. System tested;
c. Date of the test;
d. Name of tester;
e. Test pressure and pressure loss, where applicable;
f. Test results (pass/fail);
g. Test witnessed by.

10-3.1 Terminology

The Medical Gas Systems Installer shall be able to demonstrate a basic working knowledge of all terminology listed in ASSE Standard 6001, as used in NFPA 99-2005.

10-3.2 Certification of Medical Gas Systems Installers

10-3.2.1 Certification to this standard shall be through a recognized third party certification agency (see Annex N).

10-3.2.2 Certification shall include the successful completion of a minimum 32-hour training course including a written and a practical examination covering all facets of ASSE Standard 6010, NFPA 99-2005, and NFPA 50 or NFPA 55. The candidate shall have a minimum of four (4) years of documented practical experience in the installation of piping systems.

10-3.2.3 Course instruction shall be conducted by a Medical Gas Systems Instructor certified to ASSE 6050.

10-3.2.4 Recertification

Installers shall be recertified to subsequent editions of NFPA 99.